

Nepenthes tenax C. Clarke & R. Kruger (Nepenthaceae), a new species from Cape York Peninsula, Queensland

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Summary

Clarke, C. & Kruger, R. (2006). *Nepenthes tenax* C. Clarke & R. Kruger (Nepenthaceae), a new species from Cape York Peninsula, Queensland. *Austrobaileya* 7(2): 319–324. *Nepenthes tenax*, endemic to the Cape York region of Queensland, is newly described and illustrated. The distribution, habitat and conservation status of this species are discussed, as well as the differences between *N. tenax* and its close relative, *N. mirabilis* (Lour.) Druce. An identification key to Australian Nepenthaceae is provided.

Key Words: Nepenthaceae, *Nepenthes mirabilis*, *Nepenthes rowanae*, *Nepenthes tenax*, new species, Australian flora, Queensland flora, Cape York, identification key

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Introduction

The tropical pitcher plant genus *Nepenthes* consists of approximately 85 species, the majority of which occur in Southeast Asia, with outlying species in Madagascar, Sri Lanka, Seychelles, India, New Caledonia and Australia (Cheek & Jebb 2001; Clarke 1997, 2001). Bailey (1881, 1897, 1898, 1900, 1905) and Mueller (1866) described eleven species from the Cape York peninsula region of Queensland, but Danser (1928) reduced all of these to synonyms of the widespread species, *N. mirabilis* (Lour.) Druce. Danser's interpretations have been upheld in recent revisions or flora accounts of the genus (Stanley 1982; Jebb & Cheek 1997; Cheek & Jebb 2001), but the types of Bailey's taxa held at the Queensland Herbarium (BRI) have not been studied in detail since Danser's revision. Moreover, detailed field observations of Australian *Nepenthes* have perhaps never been conducted – much of the key material at BRI was collected by Frank Jardine in the 1890's and specimens collected after that time are mostly from well-explored, easily accessible localities where *N. mirabilis* (typical facies) is abundant. The most distinctive of Bailey's taxa, *N. rowanae* F.M. Bailey, is confined to low-lying swamps near the Jardine River

which are flooded – and therefore inaccessible – for much of the year. As a result, this species has remained poorly known until very recently.

In 2001, the second author made several expeditions to Cape York to relocate the type locality of *Nepenthes rowanae* in the wild. He was successful and our subsequent research showed that *N. rowanae* is indeed a distinct species, which we recently reinstated at species rank (Clarke & Kruger 2005). While conducting field observations of *N. rowanae* in the Jardine River system, we encountered another *Nepenthes* taxon which could not be readily identified. After examining all of the *Nepenthes* specimens at BRI we concluded that it was an undescribed species, which is described as *Nepenthes tenax* here.

Taxonomy

Nepenthes tenax C. Clarke & R. Kruger, **species nov.** *N. mirabilis* similis sed ascidiis infundibuliformibus, lamina subpetiolata et habitu erecto nec scandenti differt. **Typus:** Queensland. COOK DISTRICT: Head of Cowal Creek near Cape York, *F.W. Whitehouse s.n.* (holo: BRI [AQ46887]).

Monopodial shrub, new stems generally arising from the rootstock after the main stem dies. Indumentum: all young parts of the plant

sparingly to densely covered with short simple and stellate hairs, most of which are caducous. Stems terete, up to 0.5 (–1) m long, 2–6 mm thick, internodes 8–10 mm long. Rosette leaves sessile, very narrowly linear, up to 60 mm long and 8 mm wide, margins more or less parallel throughout, contracting gradually; apex acute; base slightly widened, clasping the stem for two-thirds of its circumference; tendrils up to 25 mm. Leaf blades of the erect stems subpetiolate, lanceolate, up to 110 mm long and 25 mm wide, the margins held close together so that the blade forms a highly pronounced “V-shape” in cross section; longitudinal veins 3 or 4 on each side of the mid-rib, often indistinct on dried specimens, pennate veins forming a densely branched network arising from the midrib and spreading towards the margins; apex acute; base clasping the stem for half to two-thirds of its circumference, not decurrent. Tendrils up to 60 mm long, highly tensile, with a tight curl (or occasionally a pronounced kink) in the middle, insertion simple. Upper two-thirds of the aerial pitchers held above the leaf blade. Rosette pitchers rarely produced, ovoid to infundibular in the lower third, cylindrical above, up to 55 mm high and 10 mm wide; two wings, up to 2 mm wide, bearing multicellular fringe elements (up to 2 mm long) that run from the peristome to the lower quarter of the pitcher. Tendril insertion at the front or side. Mouth round, oblique throughout, peristome cylindrical, up to 2 mm wide, ribs distinct but minute, teeth distinct, but very short (up to 0.2 mm long). Inner surface glandular in the portion below the hip, glands round, recessed in the upper portion, up to 0.1 mm wide, *c.* 1500 per cm². Lid wider than the pitcher mouth and held close to the peristome, resulting in a narrow opening to the pitcher, broadly ovate, indented at the apex, no appendages. Spur simple or bifid, up to 2 mm long. Aerial pitchers infundibular throughout, with or (more commonly) without a hip about one quarter of the way up from the bottom, up to 110 mm high and 20 mm wide, broadest at the mouth. Wings reduced to ribs and lacking multi-cellular fringe elements. Tendril joins the pitcher at the rear, but is generally positioned so that the apex of the leaf blade is pressed against the side of the pitcher in

the lower quarter. Inner surface glandular in the lower one-quarter to one-third, glands as in the lower pitchers. Mouth round, oblique throughout, peristome cylindrical, up to 2 mm wide, ribs distinct but minute, up to 0.3 mm wide, teeth distinct but short, up to 0.4 mm long. Lid ovate, indented at the apex, no appendages, considerably broader than the mouth and positioned close to the peristome, so that the opening of the pitcher is very narrow. Glands on the underside of the lid ovate, up to 0.2 mm long, *c.* 100 per cm² near the centre. Towards the margins, the glands are smaller (up to 0.1 mm long) and somewhat more numerous (up to 150 per cm²). Inflorescence a raceme, peduncle up to 80 mm long, rachis up to 80 mm long. Pedicels (or, occasionally, two-flowered partial peduncles) up to 8 mm long, lacking bracteoles, sepals ovate, up to 4 mm long; column of male flowers ≤ 4 mm long. Mature fruits up to 12 mm long. **Fig. 1.**

Additional specimens examined: Queensland. COOK DISTRICT: Somerset, Cape York, *Jardine s.n.* (BRI [AQ46886]); S edge of Jardine swamp *c.* 3 km S of Jardine River on Old Telegraph Line road, Mar 1992, *Wilson 8190* (BRI); Jardine River N.P., swamp near head of Olive Creek, *c.* 2 km north of Jardine River, Aug 2003, *Clarke & Kruger 1, 2* (BRI).

Distribution and habitat: Biogeographic region: CYP. This species is apparently confined to open sandy substrates or saturated peat in the lower portions of swamps on floodplains surrounding the Jardine River on northern Cape York peninsula. The surrounding habitat is described by Fox *et al.* (2001) as open heath, Type C15 – dominated by *Asteromyrtus lysicephala* (F.Muell. & F.M.Bailey) Craven (Kennedy’s Heath). Other conspicuous plants in this habitat are various Cyperaceae, *Banksia dentata* L.f., *Utricularia* spp., *Byblis liniflora* Salisb., *Drosera burmanii* Vahl. and *D. petiolaris* R.Br. ex DC.

Phenology: This is yet to be fully documented. Mature fruits were observed on wild plants in August 2002. The period from which flowers open to the ripening of fruits in *Nepenthes* is usually about three months, which suggests that flowering in that year may have commenced in May. However, very few plants flowered in 2003, suggesting that flowering cycles are irregular.

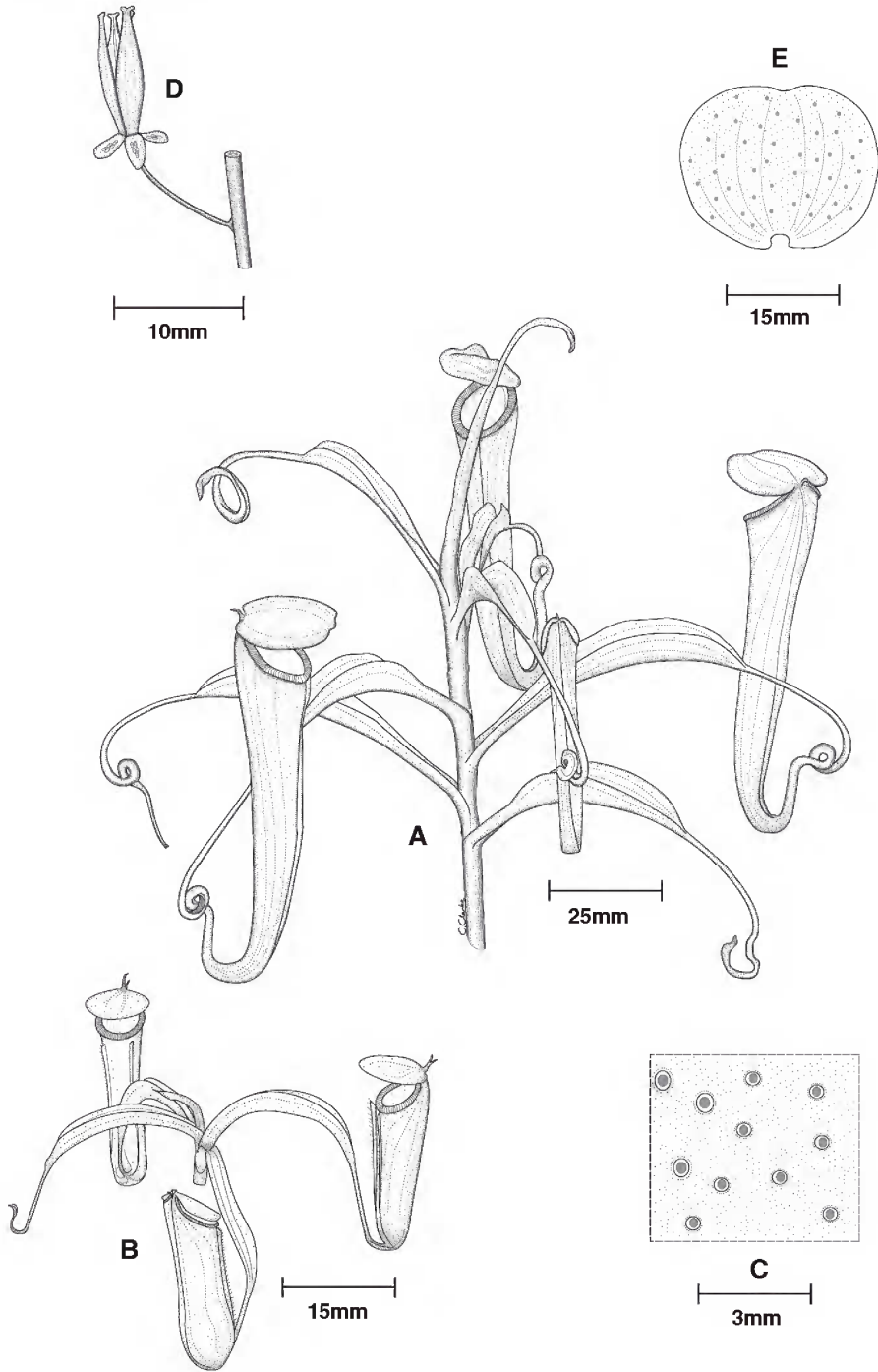


Fig. 1. *Nepenthes tenax*. A. fragment of stem bearing upper pitchers. B. rosette bearing lower pitchers. C. detail of glands on lower surface of lid (larger glands on left of illustration lie near the midline of the lid, smaller ones towards the margins). D. fruit. E. underside of lid. (A & B drawn from photographs of plants taken at the type locality, C–E from Clarke & Kruger 1, 2, 1 respectively).

Notes: *Nepenthes tenax* is a diminutive plant, with free-standing, erect stems up to 1 m in length and pitchers rarely exceeding 15 cm in height. The pitchers are borne on very short tendrils, with 3–6 operative at any one time, giving the plant a “cartwheel” appearance when viewed from above. The tendrils generally have a tight curl in the middle, but unlike other species, they do not grip surrounding objects. Rather, they are highly tensile, holding the pitchers erect (even in strong winds), with the upper 2/3 of the pitcher held above the leaf blade. This habit is highly distinctive with only *Nepenthes madagascariensis* Poir recorded as growing in a similar manner. The pitchers and leaf blades are generally light greenish-yellow in colour. This combination of characteristics makes *N. tenax* instantly recognisable in the field, but at some localities there appears to be introgression with *N. mirabilis*, which can make identification of some plants difficult. In our explorations along the Jardine River we found a single population of an extraordinary “small form” of *N. tenax* that bears the smallest functional aerial pitchers of any *Nepenthes*. These are at most 50 mm high and 8 mm wide (but are usually half this size), while the leaf blades are ≤ 40 mm long and the stem rarely exceeds 150 mm in height. The inflorescences of these plants are approximately 100 mm long. The site at which the small form grows appears to be permanently inundated – even after two consecutive below-average wet seasons, as we were wading waist-deep through water and muddy peat when we came across them (during June 2003). In most years, this site would be inaccessible.

Nepenthes tenax has rarely been collected. At BRI there were, prior to this study, only three specimens that could be equated with this taxon. *Whitehouse s.n.* (BRI [AQ46887]) is a beautifully preserved specimen bearing upper pitchers and an inflorescence, and is designated here as the holotype.

Nepenthes tenax bears a superficial resemblance to the taxon described as *N. alicae* F.M. Bailey (reduced to a synonym of *N. mirabilis* by Danser (1928), an interpretation that we support), but several characteristics of the types serve to distinguish

them. The holotype of *N. alicae* (*Jardine s.n.*, BRI [AQ278786]) consists only of a pair of short stems bearing several lower pitchers, plus a single upper pitcher and its tendril. According to notes on this specimen, Frank Jardine collected more material of *N. alicae* to assist Bailey in preparing his description. He put the material in his pocket for the trip home from the type locality, but most of it fell out on the way and was lost, except for the two short stems and single upper pitcher! *N. alicae* is similar in stature to *N. tenax*, but the tendrils of the rosette pitchers are approximately 60 mm long, whereas those of *N. tenax* rarely exceed 25 mm. The tendril of the sole aerial pitcher of *N. alicae* appears to be considerably longer than the pitcher itself, is not curled and based on its arrangement, the pitcher mouth would have been held below the leaf blade. In *N. tenax*, the tendrils of the upper pitchers are tightly curled (or have a very pronounced kink in the middle), shorter than the pitchers are tall, with the upper half of the pitcher held well above the leaf blade. The short, gnarled stems of the holotype of *N. alicae* appear to have grown slowly for a number of years prior to being collected. The stems had reached lengths of about 100 mm, yet the leaves were still producing rosette pitchers. All plants of *N. tenax* that we have seen produce aerial pitchers on stems that exceed 50 mm in length. Indeed, rosette pitchers are very rarely observed in *N. tenax*. Jardine made a further collection of material for Bailey’s work on *N. alicae* (*Jardine s.n.* BRI [AQ46886]). This contains several fragments of *N. tenax* and it is quite possible that it was this taxon that Jardine felt was of primary interest. However, Bailey did not equate the *N. tenax* fragments with *N. alicae*, noting that the plants were merely “near alicae Bail.” on the label. On this evidence, we conclude that the taxon Bailey described as *N. alicae* was based on stunted plants of *N. mirabilis*, or perhaps hybrids of *N. mirabilis* and *N. tenax*.

We have observed two putative natural hybrids involving *Nepenthes tenax* in the wild: *N. tenax* \times *N. mirabilis* and *N. tenax* \times *N. rowanae*. The former appears to be rather common, forming large swarms in some swamps, whereas the latter is rare and has

only been observed as singletons at a few sites where *N. rowanae* and *N. tenax* are sympatric.

Conservation status: We observed twelve discrete populations of *Nepenthes tenax* in various swamps along and around the Jardine River, but few of these are currently represented by collections in herbaria. It is highly probable that further populations exist in swamps that are yet to be explored. According to the IUCN guidelines (IUCN 2001), a category of LR(cd) (= lower risk,

conservation dependent) is proposed, as all known populations occur within protected areas.

Etymology: The Latin, *tenax*, means tenacious and refers to the ability of this species to produce stems and pitchers that remain upright in open areas, despite regular exposure to strong winds and without the support of surrounding objects or plants, a characteristic that is not observed in other Nepenthaceae.

Key to Australian *Nepenthes*

- 1 Upper pitchers with a horizontal ridge (or “hip”) immediately beneath the peristome; margins of leaf blade very gradually tapered towards the apex, which is obtuse and slightly peltate **N. rowanae** F.M.Bailey
 Upper pitchers with hip lacking entirely or present in the lower quarter; margins of leaf blade generally contracted abruptly towards the apex 2
- 2 Leaf blades with a distinct petiole at the base; upper pitchers bulbous or narrowly ovoid below the hip, stems climbing to 3 m, supported by surrounding vegetation **N. mirabilis** (Lour.) Druce
 Leaf blades sub-petiolate at the base, upper pitchers infundibular throughout, stems free-standing to 0.5 (–1) m **N. tenax** C.Clarke & R.Kruger

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